

Please amend the Patent Application as follows.

IN THE DRAWINGS:

Amend Drawing Figures 12C and 24B as submitted herewith.

IN THE SPECIFICATION:

At page 1, line 2, before the section entitled "TECHNICAL FIELD", insert, the following section:

CROSS-REFERENCES TO RELATED APPLICATIONS

A1 This application is a continuation of U.S. Patent Application S/N 10/007,103, filed December 4, 2001, entitled: ROBOTIC VACUUM CLEANER. U.S. Patent Application S/N 10/007,103 is incorporated by reference in its entirety herein.

IN THE CLAIMS:

Cancel Claim 1 and replace it with claims 36-62.

36. An apparatus for autonomous operation over an area comprising:

a control system;

A2 a line; and

a directional detecting member including a sensor, said sensor coupled to said line and said control system, said sensor configured for detecting the directional movement of said line and signaling said control system with a signal corresponding to said directional line.

37. The apparatus of claim 36, wherein said control system is configured for signaling a drive system for moving said apparatus in correspondence with said directional movement of said line.

38. The apparatus of claim 36, wherein said line includes a wire.

39. The apparatus of claim 38, wherein said directional detecting member additionally includes:
a take-up roller for receiving said line in a wrap around manner.

A2 40. The apparatus of claim 39, wherein said take-up roller is spring biased.

41. The apparatus of claim 40, wherein an end of said line is received by said take-up roller.

42. An apparatus for autonomous operation over an area comprising:

at least one first transmitter;

at least one second transmitter;

at least one receiver for receiving signals originally transmitted from both of said at least one first transmitter and said at least one second transmitter;

said at least one first transmitter offset from said at least one second transmitter at a distance and an angling such that detection of a signal by said at least one receiver from said at least one first transmitter absent detection of a signal from said at least one second transmitter corresponds to detection of a door or entryway.

43. The apparatus of claim 42, wherein said at least one first transmitter and said at least one second transmitter include one infra red transmitter and said at least one receiver includes one infra red receiver.

44. The apparatus of claim 43, wherein said at least one first transmitter is positioned approximately 20 to approximately 30 degrees with respect to said at least one second transmitter.

45. A system for detecting the presence of an entryway comprising:

an apparatus for autonomous operation over an area comprising:

A2 at least one first transmitter;

at least one second transmitter;

at least one receiver for receiving signals originally transmitted from both of said at least one first transmitter and said at least one second transmitter;

said at least one first transmitter offset from said at least one second transmitter at a distance and an angling such that detection of a signal by said at least one receiver from said at least one first transmitter absent detection of a signal from said at least one second transmitter corresponds to detection of said entryway; and

at least one retroreflector for positioning at least proximate to said entryway.

46. The system of claim 45, wherein said at least one first transmitter and said at least one second transmitter include one infra red transmitter and said at least one receiver includes one infra red receiver.

47. The system of claim 46, wherein said at least one first transmitter is positioned approximately 20 to approximately 30 degrees with respect to said at least one second transmitter.

48. An apparatus for autonomous operation over an area comprising:

a drive system; and

at least one sensor in communication with said drive system, said sensor configured for detecting at least one signal for confining said apparatus to operate in a predetermined location within said area.

42 49. The apparatus of claim 48, wherein said at least one sensor is configured for detecting two signals for confining said apparatus to operate in said predetermined location within said area.

50. The apparatus of claim 49, wherein said two signals include, a first signal corresponding to inside of said predetermined location within said area and a second signal corresponding to outside of said predetermined location within said area.

51. The apparatus of claim 48, wherein said at least one sensor is an infra red light sensor.

52. A system for limiting coverage of an apparatus to a portion of an area comprising:

an apparatus for autonomous operation over an area comprising:

a drive system; and

at least one sensor in communication with said drive system, said sensor configured for detecting at least one signal for confining said apparatus to operate in a portion of said area; and

a transmitter for sending at least one signal corresponding to at least one boundary of said portion of said area.

53. The system of claim 52, wherein said sensor is configured for detecting two signals for confining said apparatus to operate in said portion of said area.

54. The system of claim 53, wherein said two signals include, a first signal corresponding to inside of said predetermined location within said area and a second signal corresponding to outside of said predetermined location within said area.

55. The system of claim 52, wherein said sensor is an infra red light sensor and said transmitter is an infrared light transmitter.

56. A method for detecting a surface type comprising:

providing an apparatus for moving along a surface, said apparatus comprising: at least one rotating member configured for contacting a surface, and a motor in communication with said rotating member;

shutting down said motor for a predetermined time period to cease rotation of said at least one rotating member; and

measuring a back electromotive force on said motor provided by the resistance of said surface to said rotation of said at least one rotating member.

57. The method of claim 56, additionally comprising: moving said apparatus along a surface.

58. The method of claim 57, wherein said shutting down said motor includes continuing to move said apparatus along said surface.

59. The method of claim 56, additionally comprising: restarting the motor and rotating said at least one rotating member at a speed corresponding to the measured back electromotive force on said motor.

60. The method of claim 56, wherein said predetermined time period for shutting down said motor is approximately 0.5 seconds.

61. An apparatus for surface detection comprising:

a control system;

a drive system;

at least one rotating member configured for contacting a surface;

a motor in communication with said rotating member; and

at least one sensor in communication with said motor, said at least one sensor configured for measuring back electromotive force on said motor when rotation of said rotating member is ceased, said at least one sensor configured for signaling said control system for restarting said motor and rotating said at least one rotating member at a speed corresponding to the measured back electromotive force on said motor.